

L 59622-65

ACCESSION NR: AP5012467

2

apparatus and the experimental procedure are described in detail. The apparatus was used to investigate short-lived isotopes and isomers with half life  $\sim 1$  millisecond produced in  $(n, 2n)$  reactions on several nuclei. The average yield of neutrons from the  $D + D$  reaction was measured by the silver activation method, while that from the  $D + T$  reaction was measured by the copper activation method. Other characteristics measured were the mass composition of the ion beam, the ion and electron currents in the accelerating gap, the dependence of the relative deuterium content and of the neutron yield on the number of pulses, the dependence of the neutron yield in the pulse on the spark power, and the stability of the neutron yield over a prolonged series of pulses, and the dependence of the target fatigue on the number of pulses. It is noted that the new version of the generator is superior in its characteristic than the older one. 'The authors thank I. P. Selinov and I. M. Rozman for interest in the work and for valuable advice.'

ASSOCIATION: None

Card 2/3

L 59622-65

ACCESSION NR: AP5012467

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SUBMITTED: 08Feb64

ENCL: 00

SUB CODE: NP

NR REF SOV: 004

OTHER: 004

Card

RR  
3/3

MURGULIYA, L.

V. Condensation of dimethylaminopropionol with phenol in the presence of phosphoric acid and ascorbic acid. A. I. Kakh-  
nashvili, T. Lomvitz, and L. Murguliya (State Univ., Tj-CI)

(ib). Zhur. Obshch. Khim. 25, 117-20; J. Gen. Chem. (U.S.S.R.) 25, 101-3 (1953) (Engl. translation); cf. C.A. 47, 5370c. To 10 g. PhOH and 4 ml.  $H_2O_2$  (d. 1.701) was added dropwise 11 g.  $Me_2C(OH)CH_2CH_3$ , the final temp. reaching 45°; after 1 hr. stirring the mixt. was dild. with  $H_2O$ , washed and dild., yielding after extr. with aq. NaOH, 0 g.  $p-HOC_6H_4CH_2CH_2CH_3$  (I), b. 127-8°,  $n_D^{20}$  1.5345,  $d_4^{20}$  0.9966; hydrogenation over Pd gave the  $p-HOC_6H_4CH_2CH_2CH_3$ , b. 128-30°,  $n_D^{20}$  1.5185,  $d_4^{20}$  0.9665. Methylation of I with  $Me_2SO$  in 10% NaOH gave the perthoxy analog (II), b. 113-15°,  $n_D^{20}$  1.5238,  $d_4^{20}$  0.9793. Heating I with  $ClCH_2CO_2H$  in 10% NaOH gave  $Me_2C:CHCH_2C_6H_4OCH_3$ , m. 78-7°. Oxidation of II with  $KMnO_4$  gave  $p-MeOC_6H_4CO_2H$  and  $Me_2CO$ . I was formed in 3.5 g. yield when the reactants were stirred 5 hrs. at room temp. and 10 hrs. at 40-5° in the presence of ascorbic (sulfonic acid treated chyl). Condensation of  $p-HOC_6H_4CH_2CH_2CH_3$  with  $ClCH_2CO_2H$ , as above, gave  $p$ -iso- $PrC_6H_4CH_2CH_2CH_2CO_2H$ , m. 103-4° (from dil. EtOH). G. M. K.

(2)

MURGULY KLÁRA

The use of Methanyl Yellow as an adsorption indicator.  
János Bognár and Klára Murguly (Rákosi Mátyás Nehéztudományi Egyetem, Miskolc, Hung.). Magyar Kém. Lapok 60, 48-49 (1964). The behavior of Methanyl Yellow (I), the Na salt of *p*-aminazobenzene-*m*-sulfonic acid, as an adsorption indicator in argentometric titrations, was studied. It was found that it is suitable for halogen and  $\text{SCN}^-$  ion titrations provided that the  $\text{AcOH}$  concn. does not exceed 2N. It is not suitable for the titration of chloride ions, and no more suitable than fluorescein for bromide ions. It is quite sensitive in the detn. of  $\text{Ag}^+$  with  $\text{KBr}$  measuring solns. in a strong  $\text{HNO}_3$  medium. In the detn. of iodide ions it is less sensitive than fluorescein. It also enables the detn. of total halogens.

L. G. Aryal

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42. Investigation of the causes of  $Al_2O_3$  losses after digestion during alumina production by the Bayer method. (In French) I. Magyarosy, M. Marikasy, A. Poraxol. *Acta Technica Academiae Scientiarum Hungaricae*, Vol. 21, 1958, No. 3-4, pp. 375-380, 3 figs, 8 tabs.

Hydrolysis in aluminate solution was investigated in Hungarian aluminate factories using the Bayer method; the reaction times in the solution contacting the red mud after digestion was carried out partly by various technologies and partly by studying the effect of the contamination of the solutions on the hydrolytic decomposition. Numerical values are published for measuring hydrolysis in solutions contaminated to varying degrees by  $NaF$ ,  $Na_2CO_3$  salts. A uniform method has been elaborated for the proper preparation of specimens necessary for the investigations.

A L 11587-66 EWT(m)/ETC(F)/EWG(m)/EWP(t)/EWP(b) IJP(c) RDW/JD/JG

ACC NR: AP5028894

SOURCE CODE: UR/0316/65/000/004/0110/0115

AUTHOR: Karayev, Z. Sh.; Gadymov, A. M.; Murguzov, M. I.

52

ORG: Institute of Chemistry, AN AzerbSSR (Institut khimii AN AzerbSSR)

B

TITLE: Interaction between  $A_2^{III}B_3^{VI}$  tellurides of samarium and gallium

SOURCE: Azerbaydzhanskiy khimicheskiy zhurnal, no. 4, 1965, 110-115

TOPIC TAGS: tellurium, samarium, gallium, phase diagram, phase transition, tellurium alloy, samarium alloy, gallium alloy, semiconductivity, *semiconducting material*

ABSTRACT: The object of the study was to synthesize new chemical compounds and alloys and to learn about their properties.  $Sm_2Te_3$ - $Ga_2Te_3$  alloys were prepared by fusing mixtures of  $Ga_2Te_3$  with metallic Te and Sm in quartz ampoules at 1000-1180°C and  $1 \cdot 10^{-3}$  mm Hg.  $Sm_2Te_3$  was homogenized for 360 hours at 400°C and  $10^{-3}$  mm Hg in ratios of 5:1, 4:1, 3:1, 2:1, 1:1. The phase diagram of the  $Sm_2Te_3$ - $Ga_2Te_3$  system is shown in fig. 1. A new chemical compound of samarium-gallium-tellurium was found: its formula is  $SmGaTe_3$ . The existence of a limited solid solution in the  $Ga_2Te_3$ - $Sm_2Te_3$  system was established. It was also found that alloys and compounds of the  $Sm_2Te_3$ - $Ga_2Te_3$  system are semiconductors.

Card 1/2

L 11587-66

ACC NR: AP5028894



Fig. 1. Phase diagram of the  $\text{Sm}_2\text{Te}_3$ - $\text{Ga}_2\text{Te}_3$  system.

Orig. art. has: 5 figures, 3 tables.

SUB CODE: 07/11/84/ SUBM DATE: 01Aug84/ ORIG REF: 002/ OTH REF: 004

Hw  
Card 2/2



ACC NR: AP7004406

SOURCE CODE: UR/0226/67/000/001/0099/0104

AUTHOR: Samsonov, G. V. ; Paderno, Yu. B. ; Murguzov, M. I. ; Fedorchenko, V. P.

ORG: Institute for Problems in the Science of Materials, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Gallochalcogenides of rare earth metals

SOURCE: Poroshkovaya metallurgiya, no. 1, 1967, 99-104

TOPIC TAGS: rare earth metal, gallochalcogenide, chalcogenide, crystal lattice, electric resistance, thermal electromotive force, impurity level, semiconductor, electron structure, ionization potential, chemical bonding

ABSTRACT: The authors conclude that atoms of rare-earth metals are arranged in a crystal lattice. The electrical resistance and thermal electromotive force were measured at room temperature to 1100 K. It is shown that neodymium galloselinide is a semiconductor with a forbidden-zone width and impurity level ionization energy of 1.78 and 0.77 ev, respectively. The nature of the semi-

Cord 1/2

ACC NR: AP7004406

conductivity of  $\text{NdGaSe}_3$  is explained on the basis of the electron structure of isolated atoms and their ionization potential. An hypothesis is advanced as to the nature of the chemical bonding in chalcogenides of rare-earth metals. Orig. art. has: 1 figure and 3 tables. [Authors' abstract] [NT]

SUB CODE: 11/SUBM DATE: 10Aug66/ORIG REF: 011/OTH REF: 004/

Card 2/2

L 30073-66 EWP(w)/ETC(f)/EWP(c)/EWP(v)/T/EWP(k)/EWP(l) LIP(c) IG/EM  
ACC NR: AP6020595 SOURCE CODE: CZ/0038/65/000/010/0379/0379

AUTHOR: Murio, Jan--Murits, Ya. 54  
B

ORG: Nuclear Power Station, Skoda Plant, Plzen (Skoda, oborovy podnik Plzen, zavod Jaderne elektrarny)

TITLE: Determination of control methods for basic materials and welds of pressure vessels in nuclear reactors by very hard betatron radiation 19

SOURCE: Jaderna energie, no. 10, 1965, 379

TOPIC TAGS: flat plate, nuclear reactor, betatron, weld defect, nuclear reactor control, pressure vessel, nuclear radiation

ABSTRACT: Thick steel plates were investigated; intensity and exposition curves were determined. The accuracy of the determination of a flaw as a function of the location of the flaw were investigated. The investigation was used in the preparation of operating instructions for the Czechoslovak betatron with a capacity of 15 MeV. The article is an abstract of the report As 683/Dok. [JPRS]

SUB CODE: 18, 13 / SUBM DATE: none

Card 1/1 UDC: 621.384.634.3: 621.039.536: 621.791.056.001

MURIC, Milos

Intermittent antibiotic therapy in the treatment of severe cavitary tuberculosis and prevention of recurrences. Tuberkuloza, Beogr. 11 no.2:254-257 '59.

1. I Grudno odeljenje Gradske bolnice, Beograd, sef: prim. dr M. Muric.  
(ANTITUBERCULAR AGENTS ther.)

MURIC, Milos; VUKCEVIC, Gojko

Therapy of pulmonary and pleural tuberculosis with pituitary-adrenal hormones. Clinical experiences in adults. Tuberkuloza, Beogr. 12 no.1:23-35 '60.

1. Grudno odeljenje Gradske bolnice, Beograd (sef: prim. dr. M. Muric)

(TUBERCULOSIS PULMONARY ther.)

(CORTICOTROPIN ther.)

(CORTISONE ther.)

MURIC, Milos

New aspects of tuberculous infection. Tuberkuloza, Beogr. 12 no.2:  
149-153 '60.

(TUBERCULOSIS)

MURIC, M.; OSKANJAN, Lj.

Pulmonary tuberculosis detected during the course of a systematic and fluorographic examination. Analysis of our cases. Tuberkuloza, Beogr. 12 no.2:231-239 '60.

1. I Grudno odeljenje Gradske bolnice, Beograd (nacelnik: prim. dr. M.Muric)

(TUBERCULOSIS PULMONARY diag)

ZHURKOV, S. N., MURIKHIN, V. A., STUZKER, A. I.  
Physical-Technical Institute of Acad. Sci. USSR, Leningrad

"Submicroscopical Porosity of Deformed Polymers"

Paper submitted at

Program of the Conference on the Non-Metallic Solids of Mechanical Properties, Leningrad  
May 19 -26, 1958.



MURIKOV, D.V.

Study of the process of scooping up bulk loads with a bucket. Trudy  
Inst. gor. dela Sib. otd. AN SSSR no.7:108-121 '62.

Some data on the operation of single-bucket excavators in stone and  
ore pits. 140-145 (MIRA 16:9)

MURIKOV, L.V., inzh.; RODIONOV, G.V., doktor tekhn. nauk

Resistances arising during the scooping of bulky loads by shovel.  
Stroi. i dor. mash. 9 no.3:22-23 Mr '64. (MIRA 17:6)

MURIN, .

Effect of  $\beta$ -adrenergic stimulation on the heart rate of the rat. *Journal of Pharmacology and Experimental Therapeutics*, 1967, 161: 557-563.

1. Kafein: The effect of theophylline on the heart rate of the rat. *Journal of Pharmacology and Experimental Therapeutics*, 1967, 161: 564-573.

MURIN, Augustin

Aging of seeds as the cause of mitotic and chromosome aberrations.  
Biologia 16 no.3:173-177 '61.

(EEAI 10:9/10)

1. Katedra fyziologie rastlin Univerzity Komenskeho, Bratislava.

(SEEDS) (CHROMOSOMES) (KARYOKINESIS)

MURIN, Augustin

Study of the reversibility of mitosis and of the mitotic cycle in the root tips of *Vicia faba* L. following brief action of colchicine. *Biologia (Bratisl.)* 20 no.8:567-574 '65.

1. Lehrkanzel für Botanik an der Naturwissenschaftlichen Fakultät der Komensky Universität in Bratislava, CSSR.

L 37051-66

ACC NR: AP6027018

SOURCE CODE: CZ/0049/65/000/008/0569/0574

AUTHOR: Murin, Augustin (Candidate of sciences; Bratislava)

14  
B

ORG: Department of Botany, Faculty of Natural Sciences, Comenius University, Bratislava

TITLE: Study of the reversibility of mitosis and of the mitotic cycle in root meristem cells of *Vicia Faba* L. after a brief treatment with colchicine

SOURCE: Biologia, no. 8, 1965, 569-574

TOPIC TAGS: mitosis, plant genetics

ABSTRACT: The roots were treated for 30 minutes with various concentrations of colchicine, and the parameters of the mitotic cycle were investigated. Brief treatment with a 0.1% solution of colchicine is best for the determination of the parameters of the mitotic cycle on the basis of the accumulation of diploid and tetraploid C-metaphases. The method is suitable in investigations of the influence of various chemical substances upon the mitotic cycle. Orig. art. has: 1 figure and 2 tables. [JPRS]

SUB CODE: 06, / SUBM DATE: 25Mar65 / OTH REF: 006

LS

Card 1/1

MURIN, A. N.

Focusing of an ion beam and the energy of the ions  
in a cyclotron. A.N. Murin. Uspekhi Fiz. Nauk 24, 146-62  
(1940).- Focusing by means of a magnetic field and by the  
Thomas method are discussed.

F.H. Rathmann





<p>17 JAN 1943</p> <p>17 JAN 1943</p>		<p>17 JAN 1943</p> <p>17 JAN 1943</p>	
<p>CA</p>		<p>The separation of liquid mixtures by distillation. D. G. Adkins, A. M. Martin and A. P. Retzer. <i>Bull.</i> <i>and. vol. U. S. J. S. Chem. and. vol. 1943, 3-7 (English</i> <i>summary).—By using the method of Chapiro and Dinkel</i> <i>(C. A. 38, 494, 1943), vol. of 1943, can be used. by</i> <i>thermoanalysis. In the study of the thermoanalysis</i> <i>tube, the time needed to reach equil. and the effect of the</i> <i>distance between the inner and outer tubes on degree of</i> <i>separation of the mix. can be calculated by the Debye theory (C. A.</i> <i>34, 1861). At the end of the tube a much greater concn.</i> <i>change occurs than is predicted. When the tube is cooled</i> <i>into sections by wrapping the inner tube with strips of</i> <i>chromatographic film, the efficiency of the separation is greatly</i> <i>increased with a relatively small increase in the time</i> <i>needed to reach equil.</i> H. M. Leicester</p>	
<p>Also: Iz. Ak. Nauk USSR, Otdel. Tekh. Nauk, No. 1, 1943 Radium Institute, AS USSR</p>			
<p>ASB-SEA METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>17 JAN 1943</p>			

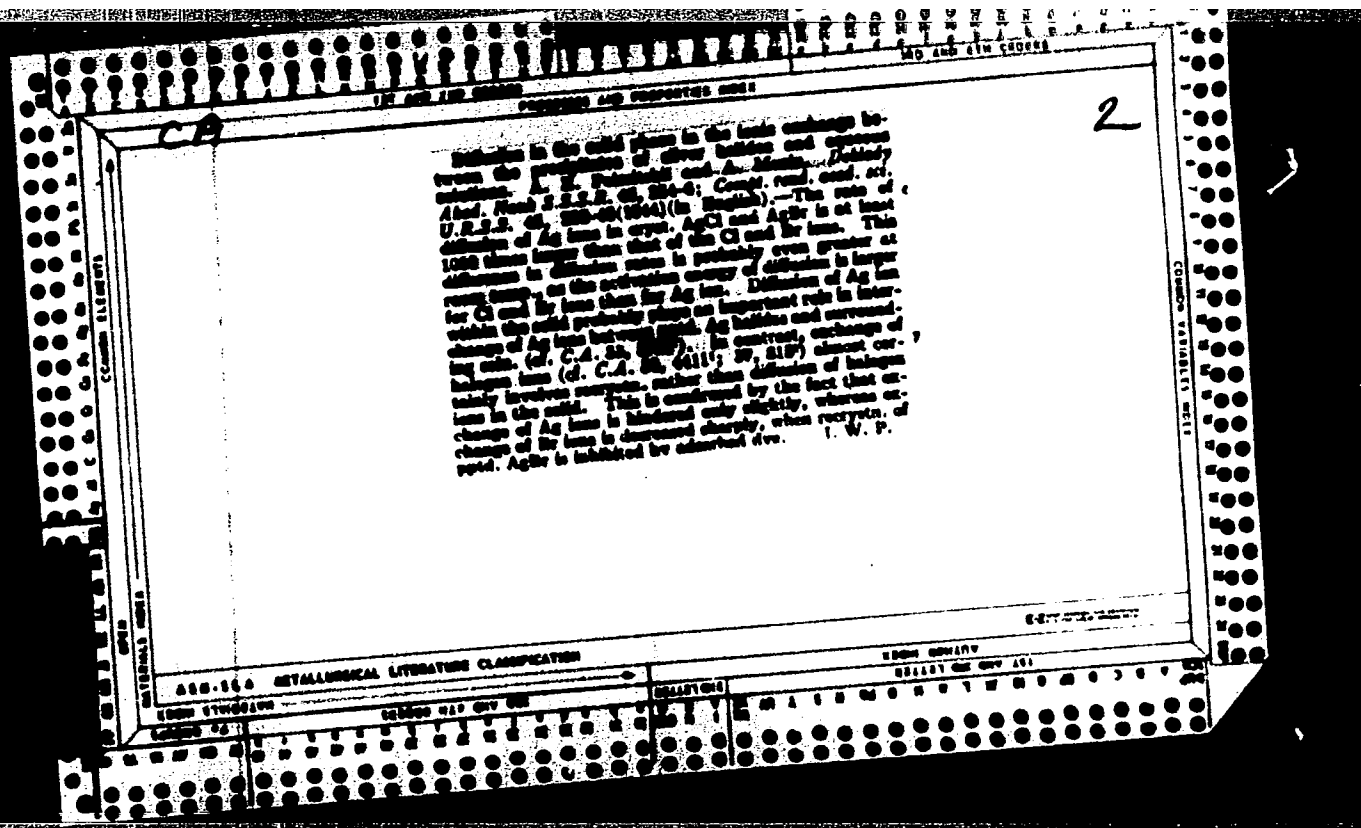
456. Field method for the collection of gases dissolved in natural and bore-hole waters. A.N. Murin (Compt. rend. Acad. Sci. URSS., 1943, 40, 113-114). -The simple aspirator described consists of a vessel filled with water and connected by a tube to a smaller vessel after evacuation of the latter by a hand-pump. The water passes over by hydrostatic pressure and by pressure of the evolved gas. Illustrative data are reported.

N.M.B.

Radium Institute, AS

1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
<p><i>ca</i></p> <p><i>2</i></p> <p>Theory of concentration process caused by thermal diffusion in solutions. A. N. Murin. <i>Compt. rend. acad. sci. U. R. S. S.</i> 41, 201-2(1943)(in English).—The theory developed by Furry, <i>et al.</i> (<i>C. A.</i> 33, 6148<sup>9</sup>) is extended to include solution of the problem of the concn. process of the rare component when the sepn. tube is provided with reservoirs of arbitrary dimensions. J. W. Perry</p> <p>Radium Inst., AS</p>																			
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION										REGIONAL INDEX									
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1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSING AND PROPERTY INDEX																			
<p>CA</p> <p>Efficiency of the thermofusion method for separation of isotopes. A. N. Murin. <i>Doklady Akad. Nauk S. S. S. R.</i> 48, 400-1 (1944); <i>Compt. rend. acad. sci. U. R. S. S.</i> 42, 266-7 (1944) (in English); cf. <i>C. A.</i> 37, 314; 38, 6164. — Thermofusion sep. processes are analyzed mathematically with respect to their thermodynamic efficiency, which is defined as the ratio of the free-energy increment due to the sep. of the mixt. and calcd. for a standard temp. to the max. work theoretically obtainable by transfer of the expended heat from the hot to the cold wall of the sep. tube. Application of the derived equations to the problem of isolating deuterium shows that diffusion of <math>D_2</math> in gaseous <math>H_2</math> is about 1000 times as efficient thermally as diffusion of <math>D_2O</math> in liquid <math>H_2O</math>. I. W. Perry</p>																			
<p>ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>10000 10000 10000 10000 10000 10000 10000 10000 10000 10000</p>										<p>10000 10000 10000 10000 10000 10000 10000 10000 10000 10000</p>									



MURIN, A. N.

"The Question of Mechanism of the Change of Ions in Solution and  
Precipitation," Dokl. AN SSSR, p. 65, 21 Oct 50

MURIN, A. N.; KLOPIN, V. G.; KLOKMAN, V. R. and NEFEDOV, V. D.

"On Achievement of Equilibrium in Distribution of a Microcomponent Between Solid Crystalline Isomorphous Phase and Melted Salt," Izvestiya Akademii Nauk, Otdel. Khimi. Nauk, No. 2, 1950.

*a digest - W-12970, 22 Aug 50*

MURIN, A.

PA 175T99

**USSR/Physics - Diffusion**

11 Aug 50

**"Experiments on Determination of Diffusion Coefficient of Sodium Ions in Sodium Chloride,"**  
A. Murin, B. Lur'ye

"Dok Ak Nauk SSSR" Vol LXXIII, No 5, pp 933-935

Describes attempts to work out exptl procedure in detn of magnitude of subject coeff of diffusion of  $\text{Na}^+$  ions in solid  $\text{NaCl}$ . Compares exptl and theoretical values for various temp. Radioactive sodium ( $\text{Na}^{24}$ ,  $T = 14.8$  hr) employed. Submitted 16 Jun 50 by Acad P. I. Lukirskiy.

175T99



2

C. A.

**Mechanism of the ion exchange between a solution and a precipitate.** A. N. Murin. *Doklady Akad. Nauk S.S.S.R.* 74, 45-46 (1961). Rates of exchange of Ag and Br ions between solns. of  $\text{AgNO}_3$  and of  $\text{KBr}$  were detd. with the aid of tagged  $\text{Ag}^+$  (long-lived radioactive isotope) and  $\text{Br}^-$  (radioactive isotope), with 3 types of  $\text{AgBr}$ : (I) freshly pptd. with a sp. surface area corresponding to 3.43 mg. methylene blue/g. ppt., (II) aged, 0.89 mg./g., (III) fused  $\text{AgBr}$  ground with quartz, 1.73 mg./g., corrected for the adsorption of the dye by the quartz powder. As 1.4 mg. of methylene blue corresponds by the data of Poleshtskii (C.A. 36, 1962), to 1 sq. m., the sp. surface area of III is  $\sim 1.3$  sq. m./g., in agreement with the 1.13 sq. m./g. detd. by radiometry. In the course of the exchange, the surface area of I, when stirred with a  $\text{KBr}$  soln., decreases to 30% of its initial value in 20 min., which indicates distinct recrystn. of the ppt. The surface area of II remains unchanged. The exchange of Ag ions is quite fast with all 3 preps. of  $\text{AgBr}$ . The exchange of Br ions is rapid only with I, much slower with II and III. The exchange of Br ions cannot proceed by self-diffusion of Ag ions in the crystals of the ppt., as was assumed by Langer (C.A. 36, 4411; 37, 818) the ratio of the coeffs. of self-diffusion of Ag and Br ions, calcd. on that assumption, does not remain const. but varies by a factor of over 100. Rather, in accordance with P. and M. (C.A. 36, 5147) the exchange of Br ions takes place through recrystn., whereas in the exchange of Ag ions, self-diffusion in the solid might be rate-detg. especially in the case of aged ppt. Variation of the concn. of the soln., 0.005-0.25 N, is proved to be without effect on the exchange of Ag ions between a  $\text{AgNO}_3$  soln. and solid  $\text{AgBr}$  or  $\text{AgCl}$  (fresh or recrystd. from  $\text{NH}_4\text{OH}$ ) at 25°, at a mass ratio Ag in soln./AgCl in ppt. = 1. The rates of exchange of Ag ion between  $\text{AgCl}$  and solns. of  $\text{AgNO}_3$  in  $\text{H}_2\text{O}$ ,  $\text{Me}_2\text{CO}$ , and abs.  $\text{EtOH}$ , were the same. Consequently, with not too small a grain size

of the ppt. ( $\sim 1 \mu$ ), exchange at the surface of the solid grains cannot be rate-detg., contrary to Zimens (C.A. 41, 9176, 4197d). Coeffs. of self-diffusion of  $\text{Ag}^+$  in the solid Ag halides can be calcd. from the rate-of-exchange data on the condition of absence of significant recrystn., on the basis of the diffusion theory of P. and M. (*loc. cit.*). From detns. at 20, 50, and 80°, the activation energies for the Ag-ion exchange are detd., for finely ground fused  $\text{AgBr}$  to 4 kcal./mole, and for finely ground fused  $\text{AgCl}$  to  $\sim 10$  kcal./mole. These energies are interpreted as the heats of self-diffusion of the Ag ions in the corresponding solid halides. In particular, the value for  $\text{AgBr}$  compares with the low-temp. activation energy of elec. cond. of  $\text{AgBr}$  detd. by Shapiro and Kolthoff (C.A. 41, 2301g).

N. Thon

MURIN, A.

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# USSR :

Experiments for the determination of the mean range of recoil nuclei in heavy halides of lead. A. Murin, B. Lur'e, and V. Pavlov. *Doklady Akad. Nauk* 1951, 7, 245-7 (1951). The recoil nuclei, which result from the  $\alpha$ -decay of  $RdTh$  and  $Th C''$ , are collected on the surfaces of cylinders made of  $PbCl_2$  and  $PbI_2$ . A thin surface layer ( $\sim 10^{-2}$  cm.) is then cut off, and its activity is measured. The mean range of the recoil nuclei in  $PbCl_2$  and in  $PbI_2$  is deduced from the results obtained and compared with the theoretical formulas for collision loss. The agreement between theory and exptl. results is satisfactory for  $PbCl_2$  but somewhat less so for  $PbI_2$ . E. Gory...

USSR/Physics - Diffusion

1 Oct 51

"Diffusion of Silver and Bromine Ions in Solid Bromide," A. Murin, Yu. Tush, Radium Inst Khlopin, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXX, No 4, pp 579-581

Purpose of this work is to measure the coeffs of diffusion of Ag and Br ions at sufficiently high temps when it is possible to det directly these quantities with the aid of radioactive indicators. Used the method of "ideal contact" proposed by C. Tubandt. Tabulates the results of measurements of diffusion

222173

(Ag<sup>+</sup>: D = 1.02.10<sup>-7</sup> sq cm/sec; Br<sup>-</sup>: D = 2.9.10<sup>-11</sup>).  
Submitted 20 Jul 51 by Acad P. I. Lukirskiy.

222173

MURIN, A.

MURIN, A. N.

USSR/Chemistry - Radioactive Isotopes Sep/Oct 52

"Enrichment of Radioactive Elements by the Method of Nuclear Recoil," A. N. Murin, V. D. Nefedov, Leningrad

"Uspekhi Khim" Vol. XXI, No 5, pp 534-565

Gives a general review of the subject, mainly on the basis of foreign publications (30 references out of 151 are Russian). Lists 9 references dealing with the work of V. G. Khlopin and his group on the theory and use of specific, nonisotopic carriers.

214T29

MURIN, A.; KHEYMAN, A.

On the abstract "Defects of silver bromide lattices." Usp. fiz.  
nauk 51 no.3:430-431 # '53. (MLRA 6:12)  
(Silver bromide) (Crystallography)

MURIN, A.

"Concerning the Additive Property of Soret's Coefficients," by A. Murin and D. Popov, Radium Inst im. V. G. Khlopin, Acad Sci USSR, Doklady AN SSSR, Vol 88, No 5, 1953, pp 879-882.

W-29318, summary in dossier for Popov, D.

MURIN, A.N.

IOFFE, A.F.; LEBEDEV, A.A.; FOK, V.A.; STARIK, I.Ye.; KONSTANTINOV, B.P.;  
DZHELEPOV, B.S.; PERFILOV, N.A.; DOBRETSOV, L.N.; STARODUBTSEV, A.V.;  
NEMILOV, Yu.A.; ZHDANOV, A.P.; MURIN, A.N.; AGLINTSEV, K.K.; TSARE-  
VA, T.V.; SHUL'MAN, A.R.; YEREMETEV, M.K.

P.I. Lukirskii; obituary. Vest. AN SSSR 24 no.12:62 D '54. (MLBA 8:1)  
(Lukirskii, Petr Ivanovich, 1894-1954)

MURIN, A.

USSR/Physics

Card 1/1 Pub. 22 - 15/47

Authors : Murin, A. and Lur'e, B.

Title : Experimental study of the diffusion of silver and lead ions in silver bromide

Periodical : Dok. AN SSSR 99/1, 53-55, Nov 1, 1954

Abstract : Experimental studies intended to determine the coefficients of diffusion of silver bromide are described. It resulted in construction of equations, the solution of which is done graphically (for silver diffusion). Ten references: 4-USSR (1928-1952). Graphs.

Institutions : Radium Institute im. V. G. Khlopin of the Acad. of Scs. of the USSR and Leningrad State University im. A. A. Zhdanov

Presented by : Academician P. I. Lukirskiy, July 1, 1954



MURIN, A. N.

USSR/Physics

Card 1/1 Pub. 22 - 11/45

Authors : Murin, A. N.; Kazakova, G. N.; and Lur'e, B. G.

Title : Experiments with diffusion of bromine in solid argentum-bromide for purposes of studying

Periodical : Dok. AN SSSR 99/4, 529-531, Dec 1, 1954

Abstract : Experiments with bromine diffusion in solid argentum-bromide are described. Bromine diffusion of pure bromine as well as brominated samples were studied with the help of a radioactive indicator  $\text{Br}^{82}$ . Two methods - the contact and the adsorption methods - were used. The first one was used in the cases of pure bromine samples, the second, in the cases of brominated samples. Diffusion coefficients obtained by both methods are considered quite satisfactory and can be expressed as follows:  $D_{\text{Br}} = 0.50e-24000 \text{ RT cm}^2/\text{sec}$ . Coefficients of electric conductivity of bromine and brominated samples were also determined. Ten references 7-USSR (1937-1954). Diagrams.

Institution : Leningrad State University im. A. A. Zhdanov

Presented by: Academician P. I. Lukirskiy, June 9, 1954

MURIN, Andrey Nikolayevich, professor; KHOL'NOV, Yu.V., redaktor; KMLAREV,  
L.A., redaktor; IVANOVA, A.V., tekhnicheskij redaktor

[Introduction to radioactivity] Vvedenie v radioaktivnost'.  
[Leningrad] Izd-vo Leningradskogo univ., 1955. 250 p. (MIRA 9:3)  
(Radioactivity)

NEURIN H. N.

✓ Concentration of artificial radioactive isotopes of Groups IV and V by the method of recoil atoms. A. N. Murin and V. D. Nefedov. *Primenenie Mechenykh iuzmoev v Anal. Khim.*, Akad. Nauk S.S.S.R., Inst. Geokhim. i Anal. Khim. 1953, 75-8. —  $\text{SiEt}_4$  was irradiated with slow neutrons, and to the irradiated product was added an ace-

tone soln. contg. 20 mg.  $\text{NaMnO}_4$  for 250 g. of  $\text{SiEt}_4$ . The  $\text{MnO}_2$  ppt. adsorbed  $\text{Si}^{32}$ . The ppt. was filtered off on filter paper. The yield was 65  $\gamma$  Si for each 250 g. of original prepn. The concn. factor was better than 10%. Radioactive  $\text{Ge}^{68}$  was obtained by a similar method with  $\text{GePh}_4$  and  $\text{Ph}_2\text{GeF}_2$  as starting materials. In the former case the yield of radioactive  $\text{Ge}^{68}$  was  $91 \pm 4$  and in the latter 25-30%. For concn. of radioactive Sn, irradiated  $\text{Ph}_4\text{SnCl}$  or  $\text{Ph}_2\text{SnI}$  was dissolved in ether and the soln. extd. with HCl contg. small quantities of  $\text{SnCl}_2$  and  $\text{SnCl}_4$  as carrier. The yield of radioactive Sn was 80%. Radioactive  $\text{P}^{32}$  was concd. by dissolving irradiated  $\text{Ph}_3\text{P}$  in  $\text{C}_6\text{H}_6$  and extg. with distd.  $\text{H}_2\text{O}$ . Yield of activity was approx. 60%. Radioactive Sb was concd. by dissolving irradiated  $\text{SbPh}_3$ ,  $\text{Ph}_2\text{SbCl}_2$ , or  $\text{PhSbCl}_3$  (of these the 2nd was best) in ether and extg. with HCl. With multiple extn. and  $\text{SbCl}_3$  as carrier the yield was 80%. By this method there was no sepn. of  $\text{Sb}^{125}$  and  $\text{Sb}^{124}$ . Isotope exchange was observed neither in the systems  $\text{Ph}_2\text{SbCl}_2$ - $\text{Sb}^{125}\text{Cl}_3$  and  $\text{Ph}_2\text{SbCl}_2$ - $\text{Sb}^{124}\text{Cl}_3$  in ether or alc. medium even at  $100^\circ$  in sealed ampules nor in the system  $\text{Ph}_2\text{SbCl}_2$ - $\text{Sb}^{125}\text{Cl}_3$ -5N HCl. Radioactive Sb was also concd. by starting with  $\text{Ph}_2\text{SbCl}_2$  and extg. a 6N HCl soln. of the radioactive Sb with  $\text{Et}_2\text{O}$  with  $\text{AlCl}_3$  as carrier. In this case the yield of activity was 60%. No isotope exchange was observed in the systems  $\text{Me}_2\text{SbCl}_2$ - $\text{SbCl}_3$ -HCl and  $\text{Me}_2\text{SbCl}_2$ - $\text{SbCl}_3$ - $\text{CHCl}_3$ . Radioactive  $\text{Bi}^{210}$  was obtained by irradiating  $\text{Ph}_3\text{BiCl}_2$ , dissolving the irradiated product in ether, and extg. with dil. HCl contg.  $\text{BiCl}_3$  as carrier. The yield of radioactive Bi was 80%.  
M. Hosh

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Anti

Murin, A.N.

*[Handwritten mark]*

✓ Exchange mechanism in heterogeneous systems. A. N. Murin. *Primenenie Mekhaniki Atomov v Anal. Khim.* 1955. *Ann. Nauk S.S.S.R., Inst. Geokhim. i Anal. Khim.* 1955. 79-82. — A general discussion, particularly as applied to atom exchange in ppts. M. Rosch.

MURIN, A. N.

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✓ 4106 AEC-(r-2435 (Pt. 2) (p. 101-10))  
SPALLATION AND FISSION REACTIONS OF COMPLEX  
NUCLEI (Cu, La, Hf). A. N. Murin, B. K. Prokhorovskiy  
(Preobrazhenskii), I. A. Yeliseyev, and M. A. Yakimov. 4  
p. 101-10 of CONFERENCE OF THE ACADEMY OF  
SCIENCES OF THE USSR ON THE PEACEFUL USES OF  
ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE  
DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.  
This paper was originally abstracted from the Russian  
and appeared in Nuclear Science Abstracts as NSA 847539. 2m/2m

Murin, A.N.

V 7527

RADIOCHEMICAL INVESTIGATION OF THE PRODUCTS  
OF SPALLATION AND FISSION NUCLEAR REACTIONS  
FROM THE EXPOSURE OF BISMUTH TO PROTONS OF  
600 MEV ENERGY. A. N. Murin, B. K. Prokhorovskii,  
and N. E. Titov (Khlopin Machine Inst.). Izvest. Akad. Nauk  
S.S.S.R. Otdel. Khim. Nauk, No. 4, 577-85(1955) July-Aug.  
(In Russian)

②

*Morim A.N.*

✓ 470 AERE-Lib/Trans-722  
THE PRODUCTION AND THE SEPARATION OF CARRIER-FREE  
RADIOACTIVE ISOTOPES. A. H. Morin, V. D.

Metodov, and I. A. Yulandov. Translated by T. Taiton from  
Uspekhi Khim. 24, 827-74(1955). 69p.

Methods are discussed for the preparation of high specific  
activity and carrier-free radionuclides. Methods are pre-  
sented for the isolation of a number of the more commonly  
used radioactive elements obtained by cyclotron reactions.  
(125 references) (C.H.)

25H

NIKITSKY  
USSR/Physics - Solid State Physics

FD-3197

Card 1/1 : Pub. 153 6/28

Author : Nikitinskaya T. I. and Murin A. N.

Title : Thermodiffusion of sodium ions in sodium chloride crystals

Periodical : Zhur. Tekh. Fiz., 25, No 7, 1198-1203, 1955

Abstract : Thermodynamic correlations governing thermodiffusion showing the formation of a concentration gradient in presence of a temperature gradient (Soret effect) are analyzed. The value of heat transfer obtained by molecular kinetic analysis by Wirtz (Phys. Zs. 44, No 11, (1943) does not concur with experimental data. Indebted to M. A. Yeremeyev for discussions. Eight foreign references.

Institution :

Submitted : July 4, 1954



MURIN, A N

USSR/Physics - Diffusion of ions

FD-3148

Card 1/1      Pub. 153 - 4/26

Author        : Banasevich, S. N.; Lur'ye, B. G.; Murin, A. N.

Title         : Determining the coefficient of diffusion of silver ions in silver  
bromide by the method of taking off of thin layers

Periodical    : Zhur. tekhn. fiz., 25, No 13 (November), 1955, 2277-2279

Abstract      : The coefficients of self-diffusion of silver ions in compressed tablets  
of silver bromide were measured by the absorption method earlier (A. N.  
Murin, Yu. Taush, DAN SSSR, 80, No 4, 1951; A. N. Murin, B. G. Lur'ye,  
DAN SSSR, 99, No 1, 1954) and were found to deviate from the valued com-  
puted according to the Einstein equation  $D_{\text{Ag}}/Ne^2$ . To solve conclusively  
the problem of this deviation the authors conducted experiments to measure  
the concentration of tracer atoms c at various distances from the initial  
boundary x. They present the results, from which they conclude that the  
mechanism of self-diffusion and of ion conductivity in the case of silver  
bromide is one and the same, at least in the high-temperature structural-  
insensitive region. Two references.

Institution :

Submitted    : June 14, 1955

MURIN, A. N.

USSR/Chemistry - Technical books

Card 1/1      Pub. 147 - 22/22

Authors      : Starik, I. Ye.; Murin, A. N.; and Nefedov, V. D.

Title        : Critique and bibliography

Periodical   : Zhur. fiz. khim. 29/11, 2110-2110-2111, Nov 1955

Abstract     : Critical review is presented of the book by An. N. Nesmeyanov, A. V. Lapitskiy and N. I. Rudenko, entitled, "Derivation of Radioactive Isotopes," published by Goskhimizdat (State Publication of Chemical Literature) in 1954.

Institution : .....

Submitted   : .....

*Murin, A.*

USSR/ Scientists - Physics

Card 1/1      Pub. 118 - 1/8

Authors : Murin, A.

Title : Academician Petr Ivanovich Lukirekiy

Periodical : Usp. fiz. nauk 55/3, 289-298, Mar 1955

Abstract : Obituary of academician Petr Ivanovich Lukirekiy, physicist, and enumeration of his work published in the period from 1915 to 1954. A photograph of P. I. Lukirekiy is included.

Institution : .....

Submitted : .....

BARANOVSKIY, V.I.; LUR'YE, B.G.; MURIN, A.N.

Electric conductivity and self-diffusion coefficients of cations  
in silver iodide. Dokl.AN SSSR 105 no.6:1188-1191 D '55.(MLRA 9:4)

1.Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanov. Pred-  
stavleno akademikom A.F.Ieffe.  
(Silver iodide--Electric properties) (Cations)

STARIK, I.Ye.; RATNER, A.P. [deceased]; GROSHKOV, G.V.; MURIN, A.N.;  
STARIK, A.S.; GREENSHCHIKOVA, V.I.; KLOKMAN, V.P.; NEFEDOV, V.D.;  
LUR'YE, B.G.; ISHINA, V.A.; SMIRNOV, L.A.; YEFIMOVA, Ye.I.;  
TOROPOVA, M.A.; SIMONYAK, Z.N.; FRENKLIKH, M.S.; SHECHMELEVA, Ye.V.,  
redaktor; VODOLAGINA, S.D., tekhnicheskiy redaktor

[A collection of practical studies in radio chemistry] Sbornik  
prakticheskikh rabot po radiokhimi. [Leningrad] 1956. 210 p.  
(MIRA 10:1)

1. Leningrad. Universitet.  
(Radiochemistry)

MURIN, A. N.

"Survey of Experimental Data on the Distribution of Fission Fragments According to Masses and Charges", a report presented at the Conference on the Physics of Nuclear Fission, 19-21 January 1956, Atom Energ., No. 1, 1956

MURIN, A. N.

"Measurements of Radioactivity," a paper presented at the USSR Conference on Application of Tracer Atom Methods in Chemistry of Complex Compounds, Kiev, 5-8 October 1955, described in an article by Z. A. Shek, Zhur. Neorgan. Khim., 1, No.2, 1956

MURIN, A.N.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1797  
AUTHOR MURIN, A.N., NEFEDOV, V.D., BARANOVSKIJ, V.I., POPOV, D.K.  
TITLE The Enrichment of the Isotopes of Iodide, Germanium, Arsenic and Antimony obtained after the Reaction ( $\gamma$ , n).  
PERIODICAL Dokl. Akad. Nauk, 111, fasc. 4, 806-807 (1956)  
Issued: 1 / 1957

The here described experiments were carried out with the synchrotron of the Physical Institute of the Academy of Science in the USSR. The cross sections of the reaction ( $\gamma$ , n) are usually small. Thus, the maximum cross section of the reaction  $\text{Sb}^{123}(\gamma, n) \text{Sb}^{122}$  ( $E_{\gamma} = 14,8 \text{ MeV}$ ) is only  $0,363 \cdot 10^{-24} \text{ cm}^2$  with an integral cross section of the order 2 MeV.barn, and for the reaction  $\text{As}^{75}(\gamma, n) \text{As}^{74}$  it is  $\sim 0,8 \text{ MeV.barn}$ , and for the reaction  $\text{J}^{127}(\gamma, n) \text{J}^{126}$  it is  $\sim 2 \text{ MeV.barn}$ . Thus the production of preparations with high specific activity requires working out suitable varieties of the SZILARD-CHALMERS method. Works dealing with this field are very few and are cited in this connection. Apart from preparative interest the radiochemical study of the reaction ( $\gamma, n$ ) can be essential for the study of the chemistry of hot atoms within the range of high energies, for the energy liberated on the occasion of the reaction ( $\gamma, n$ ) exceeds the energy conveyed on the occasion of the reaction ( $n, \gamma$ ) by three or more orders. For purposes of enrichment the authors in most cases used element-organic compounds which had formerly been used with success for the enrichment of radio-



Dokl.Akad.Nauk, 111, fasc.4, 806-807 (1956) CARD 2 / 2 PA - 1797

active isotopes obtainable after the reaction  $(n, \gamma)$ . The irradiation of the preparations took 48 hours and was brought about by the bremsstrahlung of the synchrotron of the Physical Institute of the Academy of Science in the USSR, with a maximum energy of the  $\gamma$ -quanta of 265 MeV. The targets were mounted on a cylindrical surface at a distance of 2 cm from the axis of the bundle and did not prevent the carrying out of the most important operations. Only 10% of the total intensity of the bundle of  $\gamma$ -quanta were utilized. Special control tests showed the practically complete lack of a neutron background in the bundle. The results obtained by the authors for the enrichment of arsenic, antimony, germanium, and iodide are shown in form of a table.

A long irradiation of the target leads to a noticeable radiation-chemical dissociation of the compounds used, which, of course, reduces the corresponding enrichment factors. Furthermore, attention must be drawn to the creation of some short-lived admixtures. Therefore, the preparations must either be left lying for 36 hours after irradiation, or they must be additionally purified.

INSTITUTION: Radium Institute "V.G.CHLOPIN" of the Academy of Science in the USSR.

Leningrad State University "A.A.ZDANOV".

MURIN, A. N.

"Investigating the processes of migration of proper ions and impurity ions in silver salt crystals and alkaline earth metals," a paper submitted at the International Conference on Radiotopes in Scientific Research, Paris, 7-20 Sep 57.

MURIN, A. N.

"The Diffusion Kinetics with Respect to the Melts of Salts, Oxides, and Sulphides."

report presented at the UNESCO Conference on the Utilization of Radioactive Isotopes in Scientific Research, Paris, 9-20 Sept 1957.

Vestnik AN SSSR, 1958, v. 23, No. 1, pp. 71-78 (author Vinogradov, A. P.)

MURIN, A. N., LUR'YE, V. G.

Electric Conductivity and Diffusion in Silver Halide Samples Subjected to Plastic Deformation.

MURIN, A.N.

Mass and charge distribution of fission products. Atom.energ.  
supplement no.1:32-51 '57. (MIRA 10:10)  
(Fission products)

MURIN, A.N.; YUTLANDOV, I.A.

Establishing the cosmic age of meteorites [with summary in English].  
Geokhimiia no.1:33-35 '57. (MIRA 12:3)

1.Radium Institute, Academy of Sciences, U.S.S.R., Leningrad  
State University.

(Meteorites--Age)

MURIN, A.N.; YUTLANDOV, I.A.

Radiochemical study of reactions of deep splitting by irradiating separated copper isotopes with protons of an energy of 660 mev. Izv.AN SSSR Otd.khim.nauk no.4:408-413 Ap '57. (MIRA 10:11)

1. Radiyevyy institut im. V.G.Khlopina AN SSSR i Leningradskiy gosudarstvennyy universitet.  
(Radiochemistry) (Copper--Isotopes)

MURIN, A.N.; LUR'YE, B.G.

Electric conductivity and diffusion of plastically deformed silver  
halide samples. Probl. kin. i kat. 9:321-328 '57. (MIRA 11:3)  
(Silver halides--Electric properties)



MURIN, A.N.

"Distribution of Fission Products According to Mass and Charge", Atomnaya  
Energiya, Vol 2, No 1, Jan 57, p 100.

Sum. I322



MURIN, A. N.

Distr: 4E43/4E20/  
4E30

27  
Isotope exchange in systems containing silver halides.  
A. N. Murin and B. G. Lurie. *Zh. Fiz. Khim.* 3, 1041-5 (1967). The factors that det. the rate of exchange in the systems  $AgX_{solid} - AgNO_{3(aq)}$  ( $X = Cl, Br, or I$ ) were detd. These factors were the autodiffusion of  $Ag^+$  in the solid phase or the exchange process at the interphase boundary. For the system  $AgI_{solid} - I_{2(aq)}$  a rapid isotope exchange was observed at room temp. In such systems (for iodides or bromides) the exchange is accomplished by the diffusion of the halide atoms in the solid phase and the formation of unstable polyhalides. J. Rortay Leach.

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rmh

AUTHOR

MURIN, A.N., NEFEDOV, V.D., POPOV, D.K., BARANOVSKIY, V.I.

TITLE

On the Successive Neutron Capture in Antimony.

PERIODICAL

(O posledovatel'nom neytronnom zakhvate v sur'me-Russian)  
Atomnaya Energiya, 1957, Vol 2, Nr 6, pp 553-553 (U.S.S.R.)

ABSTRACT

On the occasion of the irradiation of a sufficiently intensive neutron flux a twofold neutron capture according to the scheme  
 $Sb^{123}(n) \rightarrow Sb^{124}(n) \rightarrow Sb^{125}(T = 2.7 \text{ Years})$   
( $T=60 \text{ Days}$ )

is possible. By means of the  $\beta$ -decay  $Sb^{125}$  goes over into  $Te^{125m}$  ( $T=58 \text{ Days}$ ) and this is the highest isomeric state of the stable  $Te^{125}$ . From the samples of the antimony irradiated by neutrons deposited for about one year (for the purpose of a sufficient accumulation of  $Te^{125m}$  in antimony) the authors separated the  $Te^{125m}$ . Stable  $Te$  here served as a carrier. The metallic tellurium was separated from the antimony by reduction with tin-dichloride. An important activity of the  $Te^{125m}$  was observed in the separated tellurium; it was identified after the half value period ( $57 \pm 4 \text{ days}$ ) from the accumulation in the antimony and from the curve of the absorption of the conversion electrons in aluminum. This curve, by the way, agrees with those given by G. Friedlander, M. Goldhaber, G. Scharff-Goldhaber, Phys. Rev., 74, 981 (1948). Thus, the existence of a successive (double) capture, which develops according to the scheme given here, may be assumed as an established fact.  
Tests were made to evaluate the cross section of the activation of

Card 1/2

KRIZANSKIJ, L.M.; MALY, J.; MURIN, A.N.; PREOBRAZENSKIJ, B.K.

Fission products of the isotopes of cesium and rare earths resulting from the fission of  $\text{Pu}^{239}$  with neutrons from nuclear reactor. Jaderna energie 3 no.5:139-140 My '57.

1. Radiyevyy institut Akademii nauk S.S.S.R., Leningrad (for Krizanskiy, Murin and Preobrazenskiy). 2. Ustav jaderne fysiky, Ceskoslovenska akademie ved, Praha (for Maly).

AUTHOR: Murin, A. N. 89-11-8/9  
TITLE: Soviet Radiochemistry (Sovetskaya radiokhimiya)  
PERIODICAL: Atomnaya Energiya, 1957, Vol. 3, Nr 11, pp. 459-464, (USSR)  
ABSTRACT: On the basis of soviet references collected in 35 groups the milestones of soviet radiochemistry are chronologically enumerated. The most important are:  
a) Radioelements in the physico-chemical system.  
1) Khlopin develops the method of the fractional precipitation of radium-barium salts.  
2) Investigation of the mechanism of the concentration compensation of microcomponents in the crystal phase.  
3) Development of the extraction and sorption methods for the separation of radioelements.  
4) Investigation of the ion exchange processes and chromatographic separation of the radioelements.  
b) Chemistry of the radioelements.  
1) Investigation of the emanation distribution in systems such as  $Rn-H_2S \cdot 6H_2O$ ;  $Rn-SO_2 \cdot 6H_2O$  and so on.  
2) Quantitative separation of radon from helium, of neon from argon, etc.  
3) Expansion of the electrochemistry of plutonium (since 1946)  
4) Expansion of the chemistry of uranium.  
c) Chemical methods for the investigation of nuclear reactions.

Card 1/2

48-7-15/21

*MURIN, A.N.*

AUTHORS: Gorodinskiy, G.M., Murin, A.N., Pokrovskiy, V.N.,  
Preobrazhenskiy, B.K.

TITLE: On Neutron Deficient Isotopes of Rare Earths which Form as the  
Result of the Reaction of a "Deep" Separation of Ta under Irra-  
diation by Protons with an Energy of 660 MeV  
(O neytronodefitsitnykh izotopakh redkikh zemel' obrazuyushchikh-  
sya v rezul'tate reaktsii glubokogo otshchepleniya Ta pri ob-  
luchenii protonami energii 660 MeV)

PERIODICAL: Izvestiya Akad. Nauk SSSR, Ser. Fiz., 1957, Vol.21, Nr 7,  
pp. 1004 - 1012 (USSR)

ABSTRACT: The rare earths were chosen for the study, since the neutron  
deficient isotopes of the lanthanides which form in the reaction  
are little investigated and sometimes also unknown. A tantalum  
target was irradiated by a synchronous cyclotron from the United  
Institutes for Nuclear Research. The separation of the rare  
earths was carried out chromatographically. The study of indi-  
vidual fractions was principally performed by the scintillation  
method by means of a  $\gamma$ -spectrometer and  $\gamma$ - $\gamma$ -coincidences.  
The scintillation- $\gamma$ -spectrometer constructed by the authors is

Card 1/3

48-7-15/21

On Neutron Deficient Isotopes of Rare Earths which Form as the Result of the Reaction of a "Deep" Separation of Ta under Irradiation by Protons with an Energy of 660 MeV

fully explained. The use of a lead collimator with an aperture in the form of a truncated cone proved to be best for determining the relative intensities of  $\gamma$ -lines. In order to remove the X-ray fluorescence of lead, tantalum-tin and copper foil were glued inside the cone. Then the investigation of the line forms is described and formulae are given for the calculation of the efficiency coefficient of the  $\gamma$ -quantum number and of others. By means of these formulae those were calculated for quite a number of X-ray and  $\gamma$ -quantum energies. The resulting data are represented on figure 1. A detailed interpretation of the measurement results is given namely for the isotopes Lu, Yb and Tu with the mass numbers from 173 to 165. Figure 2 shows the  $\gamma$ -spectrum of Lu<sup>173</sup> and figure 3 shows the decay scheme for Lu<sup>173</sup>. Figure 4 represents the  $\gamma$ -spectrum of Tu<sup>167</sup> in the section of small energy. Figure 5 records the decay scheme of Tu<sup>167</sup> and figure 6 the probable decay scheme of Tu<sup>166</sup>. There are 6 figures and 15 references, 6 of which are Slavic.

Card 2/3

*Radum Isot - V. F. Khlopov 1971*



11/11/19, 11. 11.

40-12-11/15

AUTHORS: Gorodinskiy, G. M. , Murin, A. N. , Pokrovskiy, V. N. , Prachazhenskiy, B. K.

TITLE: On Isotopes of Rare Earths With a Deficiency of Neutrons That Form in Deep Splitting (Spallation) of Ta by Protons With an Energy of 660 MeV. Information II(0 ~~neutrono defitsitaykh~~ izotopakh redkikh zemel', obrazuyushchikh v rezul'tate reaktsii glubokogo ~~rasshchepleniya~~ Ta protonami energii 660 MeV. Soobshcheniye II)

PERIODICAL: Izvestiya AN SSSR, Seriya Fizicheskaya, 1957, Vol. 21, Nr 12, pp. 1624 - 1632 (USSR)

ABSTRACT: Elements of the group of rare earths were separated from a tantalum-target. The latter was on a synchrocyclotron irradiated by rapid protons with 660 MeV and chromatographically separated. The results for the isotopes A from 160 to 134 are given here. A = 160. The observed isotopes Er and Ho with the mass number 160 form a genetic chain. The Er<sup>160</sup>-decay is according to reference 2 not accomplished by a  $\gamma$ -quantum-emission. This was again confirmed here. Thus the Er<sup>160</sup>-decay immediately passes to the original and isomeric level of Ho<sup>160</sup>. The existence of the isomer Ho<sup>160m</sup> ( $T_{1/2} = 5$  hours) was definitely determined in reference 3. Experiments were made for determining the relative probability of the transi-

Card 1/4

48-12-11/15

On Isotopes of Rare Earths With a Deficiency of Neutrons That Form in Deep Splitting (Spallation) of Ta by Protons With an Energy of 660 MeV. Information II.

tions to the isomeric and original(ground-) level of  $\text{Ho}^{160}$ . The results are given here. A = 159: Among others the long-lived isotope  $\text{Dy}^{159}$  ( $T_{1/2} = 134$  days) which does not emit any  $\gamma$ -rays was separated. A = 157: In the fraction Dy (which was purified of Y) an activity which declined with  $T = 8,5$  hours was determined. A = 156: A presence of  $\text{Tb}^{156}$  in the fraction Tb is possible. A = 155: The line 227 keV was very distinctly determined in the  $\gamma$ -spectrum of the fraction Dy. The intensity of this line decreased with  $T_{1/2} = 10$  hours. Besides it was determined that Tb with a half-decay period of about 5 days develops in the decay of the isotope Dy with  $T_{1/2} = 10$  hours. It is assumed that if  $\text{Tb}^{156}$  were present among the products of separation of Ta, its  $\gamma$ -spectrum would closely coincide with the  $\gamma$ -spectrum of  $\text{Tb}^{155}$ . A = 154: The presence of the isotope  $\text{Tb}^{154}$  in the fraction is possible. A = 153: Among the Dy-isotopes is  $\text{Dy}^{153}$  which possesses a half-decay period of 10 hours without emitting  $\gamma$ -quanta. A = 151: An activity with  $T_{1/2} = 20$  hours was determined in the Tb-fraction. A long-lived isotope  $\text{Gd}^{151}$  with  $T_{1/2} = 150$  days is present in the Gd-fraction and probably among the daughter-elements of Tb. A = 149: The spectrum of  $\text{Gd}^{149}$  contains the lines 150, 300, 347 and 520 (probably a double-

Card 2/4

15-12-11/15

On Isotopes of Rare Earths With a Deficiency of Neutrons That Form in Deep Spallation (Spallation) of Ta by Protons With an Energy of 660 MeV. Information II.

-line) keV. A = 147: Activities with  $T_{1/2} = 1.5$  days and 60 days which do not correspond to any known Gd isotope were determined in the Gd-fraction. Some time after the separation Eu<sup>147</sup>-lines occurred in the  $\gamma$ -spectrum of the Gd-fraction. Important conclusions on the relative intensity of the lines were drawn. 1.) The presence of the coincidence-peaks of the lines 120 and 200 keV with X-radiation (40 keV) indicates a coincidence of the  $\gamma$ -quanta with the X-rays of Sm<sup>147</sup>. This is confirmed by the direct tests in the scheme of the  $\gamma$ - $\gamma$ -coincidences. The lines 120 and 200 keV themselves do not yield any coincidence. 2.) The line 80 keV formally considered as really existing (reference 11) in reality is the peak of the coincidence of X-rays developing during K-capture and conversion. 3.) By evaluation of the intensity of this peak an evaluation of the conversion-coefficients can be obtained. A = 145: The activity with  $T_{1/2} \sim 60$  days was determined in the Gd-fraction and classified with the isotope Gd<sup>145</sup>. The  $\gamma$ -spectrum of Gd<sup>145</sup> consists of 115 keV-lines. The lines 640 and 750 keV belong to Eu<sup>145</sup>. According to precise data the  $\gamma$ -spectrum of Eu<sup>145</sup> ( $T_{1/2} \sim 5$  days) consists of the lines 636 and 745 with the relative intensities 1,0 and 2,3. A = 140: The activity with  $T_{1/2} \sim 3.5$  days

Card 3/4

MURIN, A. N.

**AUTHORS:** Murin, A. N.; Nefedov, V. D.; Baranovskiy; and Popov, D. K.  
(~~Leningrad~~)

**TITLE:** Chemical Effects of the Gamma, n Reaction (Khimicheskiye effekty reaktsii)

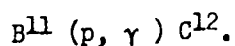
**PERIODICAL:** Uspekhi Khimii, 1957, Vol. 26, No. 2, pp. 164-175 (U.S.S.R.)

**ABSTRACT:** During the exposure of various elements by high energy gamma-rays an interaction occurs between the nuclei of the atoms of these elements and the gamma-quanta, accompanied by the emission of one or several nuclear particles. Such reactions are termed photomuclear and have very small cross sections (of the order  $0.1-0.001 \text{ }^{-24} \text{ cm}^2$ ). The gamma, n reaction is the best studied and generally has the largest section compared to all other photomuclear reactions. Radioactive isotopes with a shortage of neutrons form from this reaction, disintegrating for the most part by way of  $\beta^+$  disintegration or K-capture; many of these isotopes may be used as radioactive indicators. Study of photomuclear reactions began in the mid-1930s, and the intensive and thorough investigation of photodisintegration is now being conducted.

Card 1/5

## Chemical Effects of the Gamma, n Reaction

A great step ahead was the application (in studies on the photomuclear reactions) of gamma emission originating during the impingement of Li and B protons according to the reactions:



The invention of electron accelerators (betatrons, synchrotrons) made possible the derivation of gamma emission of any energy up to  $10^9$  eV. More than 100 radioactive isotopes have been obtained from the gamma, n reaction but only 12 studies have been published since 1950 on the chemical effects associated with photomuclear reactions.

The author next presents general data on photomuclear reactions, introducing the concept that  $E_{\text{thresh}}$  ( $E_{\text{nop}}$ ) (Threshold of photomuclear reaction) in order to separate the neutron from the nucleus, must be somewhat greater than  $Q_n$  (the bond energy of the neutron). He develops an equation for the energy of emission of the atom ( $E_M$ ) in which  $M$  = atomic mass,  $E_\gamma$  = energy of the gamma quantum,  $m$  = neutron mass,  $Q$  = energy of nuclear reaction,  $c$  = speed

Card 2/5

# Chemical Effects of the Gamma, n Reaction

of light, and  $\theta$  = the angle between the trajectories of the emitted neutron and the incident photon. The energy of nuclei of emission obtained in a gamma, n reaction is great and exceeds by far the energy of chemical bond of the atom in a molecule of any compound. The interaction of heavy high energy particles with surrounding media (solution, crystals) and the concomitant chemical changes are of great practical and scientific interest. The few studies made on this subject can be classified under two groups: 1. studies on enrichment of radioactive isotopes and 2. studies on the chemical state (of atoms) originating from the gamma, n reaction. (The author gives much detail under these groups; see explanation of tables 2-6 below, and contributions of personalities).

Table 1 presents thresholds of reaction for various nuclei and has 9 columns giving such information as atomic mass and number, product of reaction, half-life period,  $E_{\text{thresh}}$  etc. Table 2 lists elements with their corresponding compounds, reactions, methods of enrichment, output in %, and enrichment factors. The elements listed are

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## Chemical Effects of the Gamma, n Reaction

germanium, iodine, antimony and arsenic. Table 3 shows (based partly on data from a study of R. B. Duffield and A. Calvin [76] the holding for the gamma, n reaction and the n, gamma reaction in  $\text{C}^{12}$ , in which such irradiating preparations as crystals of salicylaldehyde-ortho-phenylene diimine and a solution of same in pyridine are applied. It follows from Table 3 that, depending on irradiation conditions, a considerable part of radioactive atoms is held in the form of the original compound. F. S. Rowland and W. E. Libby (81) studied the distribution of radioactive carbon originating from a reaction of  $\text{C}^{12}$  ( $\gamma, n$ )  $\text{C}^{11}$  between  $\text{CO}$  and  $\text{CO}_2$  during irradiation of liquid and solid carbon dioxide, solid  $\text{NaHCO}_3$  and water solutions of  $\text{NaHCO}_3$  and  $\text{Na}_2\text{CO}_3$ .

Results of their tests are shown in Table 4 which shows that the irradiation of solid samples leads to the condition that  $\text{C}^{11}$  is evenly distributed between carbon monoxide and carbon dioxide. However, the Rowland-Libby results do not agree with those of Z. J. Sherman and K. J. McCallum (82) which are shown in Table 5 based on their study of the radiocarbon distribution obtained in the irradiation by gamma-rays of sodium carbonate; W. J. Edwards and K. J. McCallum (83) studied the chemical composition of  $\text{C}^{11}$  originating with the irradiation of sodium bicarbonate and calcium bicarbonate by gamma-rays with a maximum energy equivalent to 23 MeV. The samples were irradiated for about 10 minutes under an intensity of gamma rays in the range of 1000-2000 roentgens/minute; results are portrayed in Table 6.

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**AUTHOR:** GUSEV, I.A., LILOVA, O.M., MURIN, A.N., PREOBRAZHENSKIY, B.K.,  
YAKOVLEV, V.A. 56-6-50/56

**TITLE:** The Gadolinium Isotope with the Mass Number 146. (Ob izotope  
gadoliniya s massovym chislom 146, Russian)

**PERIODICAL:** Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, p 1585  
(U.S.S.R.)

**ABSTRACT:** On the occasion of the irradiation of tantalum with 660-MeV  
protons new gadolinium isotopes are produced, which have hitherto  
not been mentioned in publications. On the occasion of the decay  
of these isotopes known europium isotopes are in some cases pro-  
duced, with the aid of which the mass number of the mother  
substances, i.e. of the new gadolinium isotopes can be determined.  
In the europium fractions obtained from pure fractions of gado-  
linium (they were obtained 32 hours after irradiation ended) a  
radioactive isotope can be observed which decays with a period  
of 1,6 days. According to tables published this is  
Eu<sup>146</sup>. The modification of the activity of this isotope from  
the time of its separation from the gadolinium fraction onwards  
makes it possible to estimate the period of the mother substance  
Gd<sup>146</sup> at  $12 \pm 4$  hours. It must further be noted that the mass

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The Gadolinium Isotope with the Mass Number 146.

56-6-50/56

number of the gadolinium was determined with the same degree of accuracy as in the case of the europium isotope, which was produced as a "daughter substance".

According to SEABORG'S tables this europium isotope belongs to the class C (the mass number is reliable or probable).

ASSOCIATION: Radium Institute of the Academy of Science of the U.S.S.R.  
PRESENTED BY:  
SUBMITTED: 21.3.1957  
AVAILABLE: Library of Congress

Card 2/2

AUTHOR GORODINSKIY, G.M. MURIN, A.N. POKROVSKIY, V.N., PRECHRAZHENSKIY, B.K.,  
TITOV, N.E. PA - 2109

TITLE The Radioactive Isotopes of Rare Earths Formed on the Occasion of a  
Thorough Separation (Radioaktivnyye isotopy redkikh zemel' otrazhuemye  
v reaktsii glubokogo otshchepleniya).

PERIODICAL Doklady Akademii Nauk SSSR 1957, Vol 112, Nr 3, pp 405-406 (U.S.S.R.)  
Received 3/1957 Reviewed 4/1957

ABSTRACT The authors separated the long-lived radioactive isotopes (which were  
obtained on the occasion of the irradiation of tantalum with 650 MeV  
protons on the synchrocyclotron of the United Institute for Nuclear Re-  
search) and separated then from one another chromatographically. The  
determination of half-lives, of the type and energy of radiation, as well  
as the repeated recording of  $\gamma$ -spectra by means of a scintillation spectro-  
meter (NaJ(Tl) and CsJ(Tl) crystals) made the identification of some  
previously known radioisotopes, the exact explanation of some genetic con-  
nections, the discovery of new isotopes of gadolinium, and the mentioning  
of some new lines in the  $\gamma$ -spectra of the nuclides investigated were pos-  
sible. The present report contains a short enumeration of the results ob-  
tained. 1) Cerium: The isotopes  $Ce^{134}$  and  $Ce^{139}$  were discovered the radio-  
active properties of which agree fully with the properties mentioned in  
other papers. 2) Neodym. In this fraction only the single radioactive iso-  
tope  $Nd^{140}$  (T-3,3 days) was noticed with a hitherto not investigated  $\gamma$ -  
spectrum. According to the data obtained by the authors there exists, apart  
from an intense annihilation-gamma-line with the energy of 0.51 MeV, a

Card 1/2

Radium Inst im. V.G. Klopina AS USSR

*MURIN, A. N.*  
MURIN, A. N., ERSHLER, B. V., KUKAWADZE, G. M., ANIKHINA, M. P., GORSHKOV,  
V. K., IVANOV, R. N., KRIZANSKIY, L. M. and REFORMATSKIY, I. A.

"Mass-Spectrometric Study of  $U^{233}$ ,  $U^{235}$  and  $Pu^{239}$  Fission Products."

paper to be presented at 2nd UN Intl. Conf. on the peaceful uses of Atomic  
Energy, Geneva, 1 - 13 Sep 58.

YEMEL'YANOV, V.S., otv.red.; BARDIN, I.P., red.; VINOGRADOV, A.P., red.;  
 GOL'DANSKIY, V.I., red.; GULYAKIN, I.V., red.; DOLIN, P.I., red.;  
 YEFREMOV, D.V., red.; KRASIN, A.K., red.; LEBEDINSKIY, A.V., red.;  
 MINTS, A.L., red.; MURIN, A.N., red.; NIZE, V.E., red.; NOVIKOV,  
 I.I., red.; SEMENOV, V.F., red.; SOBOLEV, I.N., red.; BAKHAROVSKIY,  
 G.Ya.; nauchnyy red.; BERKOVICH, D.M., nauchnyy red.; DANOVSKIY,  
 N.F., nauchnyy red.; DELONE, N.N., nauchnyy red.; KON, M.A.,  
 nauchnyy red.; KOPYLOV, V.N., nauchnyy red.; MANDEL'TSVAYG, Yu.B.;  
 MILOVIDOV, B.M., nauchnyy red.; MOSTOVENKO, M.P., nauchnyy red.;  
 MURINOV, P.A., nauchnyy red.; POLYAKOV, I.A., nauchnyy red.;  
 PREOBRAZHENSKAYA, Z.P., nauchnyy red.; RABINOVICH, A.M., nauchnyy  
 red.; SIMKIN, S.M., nauchnyy red.; SKVORTSOV, I.M., nauchnyy red.;  
 SYSOYEV, P.V., nauchnyy red.; SHORIN, N.A., nauchnyy red.;  
 SHREYBERG, G.L., nauchnyy red.; SHTEYNMAN, R.Ya., nauchnyy red.;  
 KOSTI, S.D., tekhn.red.

[Concise atomic energy encyclopedia] Kratkaia entsiklopediia  
 "Atomnaia energiia." [\_\_\_Tables of isotopes (according to published  
 data available at the beginning of 1958)] \_\_\_Tablitsa izotopov (po  
 dannym, opublikovannym k nachalu 1958. 12 p. Ge.: nauch. izd-vo  
 "Bol'shaia sovetskaia entsiklopediia," 1958. 610 p. (MIRA 12:1)

1. Sotrudniki Bol'shoy Sovetskoy Entsiklopedii (for Bakharovskiy,  
 Berkovich, Danovskiy, Delone, Kon, Kopylov, Mandel'tsvayg, Milo-  
 vidov, Mostovenko, Murinov, Polyakov, Preobrazhenskaya, Rabinovich,  
 Simkin, Skvortsov, Sysoyev, Shorin, Shreyberg, Shteynman).  
 (Atomic energy)

*Mr. P. P. Titov*

AUTHORS: Kalyamin, A. V., Murin, A. N., Preobrazhenskiy, B.K., 89-2-21/35  
Titov, N. Ye.,

TITLE: The Yield of Rare Earths in the Splitting up of Bismuth by 660 MeV-Protons (Vykhody redkozemel'nykh elementov pri rasshcheplenii vismута protonami s energiyey 660 MeV).

PERIODICAL: Atomnaya Energiya, 1980 Mr 2, pp. 196-197 (USSR)

ABSTRACT: With the aid of chromatographic methods especially rare-earth products were gathered in the splitting up of Bi<sup>209</sup> by 660 MeV -protons and the following cross sections were determined:

1. Ce<sup>134</sup> ~0,4 mb
2. Nd<sup>140</sup> ~0,25 mb
3. Gd<sup>147</sup> ~0,95 mb
4. Tb<sup>153</sup> ~0,9 mb
5. Tb<sup>154</sup> ~1,0 mb
6. Er<sup>160</sup> ~2,0 mb
7. Tm<sup>165</sup> ~4,0 mb
8. Yb<sup>166</sup> ~2,5 mb

Card 1/2

The Yield of Rare Earths in the Splitting up of Bismuth by 660 MeV- 89-2-21/35  
-Protons.

9. Yb<sup>169</sup> ~7,0 mb

10. Lu<sup>170</sup> ~6,5 mb

11. Lu<sup>171</sup> ~5,5 mb

There are 2 figures, 5 references, 4 of which are Slavic.

SUBMITTED: September 30, 1957

AVAILABLE: Library of Congress

Card 2/2

1. Bismuth 209 fission
2. Bismuth 209-Chromatographic analysis
3. Chromatographic analysis-Applications

MURIN, A. N.

AUTHORS: Murin, A. N., Nefedov, V. D., Sinotova, Ye. N., 78-1-33/43  
Larionov, O. V.

TITLE: The Separation of the Nuclear Isomers of Tellurium,  
Mercury and Tin (Razdeleniye yadernykh izomerov tellura,  
rtuti i olova)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 1,  
pp. 181-183 (USSR)

ABSTRACT: After giving a review of the separation methods of the  
nuclear isomers of tellurium (references 1,2) and after  
their discussion the authors chose dimethyl-dinitrate of  
tellurium as the initial compound for the separation of the  
nuclear isomers of  $T^{127}$ . It must be expected that the transi-  
tion to an intermediate level will occur by means of an in-  
ternal conversion and for this reason will be accompanied  
by a disturbance of the chemical binding of tellurium in the  
initial compound. Therefore a considerable portion of the  
nuclei of  $T^{127}$  will be present as most simple anorganic  
forms in the ground state in the preparation dimethyl-  
dinitrate of tellurium.  $T^{127}$  in its ground state was isolated

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The Separation of the Nuclear Isomers of Tellurium,  
Mercury and Tin

78-1-33/43

by means of the adsorption of these anorganic forms by ferric hydroxide. The extraction with isopropylether from 9 n HCl was intended for the removal of the an isotropic carriers, that is to say, iron. From the decay curve of the lowest isolated isomer (figure 1) follows, that only one tellurium isotope was existent, which had a half life of 9'3 hours. This testified to the presence of only the lowest isomer in the preparation. The yield of  $\text{Te}^{127}$  was determined to 80%, if it was accumulated in crystals, and to 94%, if it was accumulated in a solution. The latter value is in good correspondence with the known fact, that the isomeric transition in  $\text{Te}^{127}$  is converted to practically 100%. This implies, that the initial molecule is destroyed by every process of isomeric transition, which is accompanied by an internal conversion. The yield is somewhat lower, if accumulation takes place in crystals. The isolated radioactive  $\text{Te}^{127}$  predominantly takes its four-valent form and only 6 % of it take the six-valent one. This method possesses several advantages in comparison to the ones known hitherto (reference 1). If mercury is irradiated with neutrons according

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The Separation of the Nuclear Isomers of Tellurium,  
Mercury and Tin

78-1-33/43

to the reactions  $(n, \gamma)$  and  $(n, 2n)$ , radioactive isotopes are formed:  $Hg^{197}$ ,  $Hg^{199}$ ,  $Hg^{203}$  and  $Hg^{205}$ . Because at least six days elapsed until the separation was performed it can be assumed, that in the synthesized initial preparation - mercury diethyl only  $Hg^{203}$ ,  $Hg^{197m}$  and  $Hg^{197}$  were present. From the investigations of the Laboratory for Radiochemistry of the University Leningrad (reference 3-6) it results, that the complete aliphatic mercury derivatives may undergo an irreversible destruction of the chemical bondings on isomeric transitions. The isolation of  $Hg^{197}$  in the ground level was performed by means of adsorption on manganese dioxide. The separation from the carrier can be achieved by methods, which are based on the volatility of mercury and its derivatives. The separation of the nuclear isomers as such can be determined from a comparison of the curves of decreasing activity of the mercury preparations (figure 2). When tin is irradiated by thermal neutrons, radioactive nuclei are formed:  $Sn^{113}$  (yields  $In^{113m}$ ,  $Sn^{117m}$  and  $Sn^{119m}$  by decay). From the three latter ones stable isotopes are produced by an isomeric transmutation:  $Sn^{117}$  and  $Sn^{119}$ ,  $Sn^{121}$ ,  $Sn^{123}$  and  $Sn^{125}$  were isolated in the ground

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The Separation of the Nuclear of Tellurium,  
Mercury and Tin

78-1-33/43

state from a benzene solution of stannic tetraphenyl by way of extraction. Because of the fact, that the isomers  $\text{Sn}^{123}$  and  $\text{Sn}^{125}$  have no genetic inter-relation,  $\text{Sn}^{121}$  and  $\text{In}^{113\text{m}}$  will pass over into the water layer during the extraction. For this reason the activity measurement was started after the lapse of from 10-12 half life periods of  $\text{In}^{113\text{m}}$  ( $T = 105$  minutes). The decay curve of  $\text{Sn}^{121}$  is represented by figure 3. The accumulation of  $\text{Sn}^{121}$  with time was examined (figure 4) for the purpose of proving the genetic relation between  $\text{Sn}^{121}$  in ground state and  $\text{Sn}^{121\text{m}}$ . The method described here may be considered the most universal. It makes furthermore possible to isolate the nuclei in a low isomeric state without carriers. There are 4 figures, and 6 references, 4 of which are Slavic.

SUBMITTED: June 18, 1957

AVAILABLE: Library of Congress

Card 4/4

*Marin, A. N.*

AUTHORS: Krizhanskiy, L. M., Marin, A. N., 69-1-11/29

TITLE:  $Sr^{90}$  and  $Sr^{88}$  Yields in the  $Pu^{239}$  Fission by Reactor Neutrons  
(Vykhody  $Sr^{90}$  i  $Sr^{88}$  pri delenii  $Pu^{239}$  reaktornymi neytronami)

PERIODICAL: Atomnaya Energiya, 1958, Vol. 4, Nr 1, pp. 77-79 (USSR)

ABSTRACT: By means of a mass spectrometer the yields of  $Sr^{90}$  and  $Sr^{88}$  were determined after the  $Pu^{239}$  sample had been exposed to an integral neutron flux of  $2,7 \cdot 10^{20}$  neutrons. The strontium ratio measured was:  $Sr^{90} : Sr^{88} : Sr^{86} = 1 : (0,687 \pm 0,005) : (0,009 \pm 0,004)$   
If this measurement is carried out following the known absolute yield of  $Nd^{143}$  with 5,98%, the following absolute yields are obtained in %:

$Sr^{90}$	2,28
$Sr^{88}$	1,35

There are 2 tables, and 9 references, 2 of which are Slavic.

SUBMITTED: August 27, 1957

AVAILABLE: Library of Congress

Card 1/1

SOV. 48-77 7-7/86

AUTHORS: Baranovskiy, V. I., Murin, A. N., Pokrovskiy, V. M.,  
Yutlandov, I. S.

TITLE: Mass Numbers of Tb Isotopes Showing Neutron Deficiency  
(Otkrytykh chislakh neytronodefitsitnykh izotopov Tb)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1956  
Vol. 22, Nr 7, pp. 808-810 (USSR)

ABSTRACT: For a more precise determination of the mass numbers of Tb isotopes present in the fraction, the attempt was made to establish the genetic connections by means of a repeated chromatographic separation of the daughter elements, and by examining these. This method permits to determine both the mass number of the parent isotope (for a known daughter isotope), and its half-life (provided that the quantity of daughter isotope separated will be proportional to  $e^{-\lambda t}$  for equal intervals between the separations,  $\lambda$  being the decay coefficient). In this way the Tb isotopes with  $A = 149, 151$ , and  $153$  may be studied if the corresponding radioactive Gd isotopes ( $Z = 64$ ) are known. Other Tb isotopes, however, in decay transmutate to stable Gd isotopes. With all four separat-

Card 1/3

DOV/49-22-7-7/86

Mass Numbers of Tb Isotopes Showing Neutron Deficiency

ions carried out from Tb, two isotopes  $Gd^{153}$  and  $Gd^{151}$  were observed. No other daughter elements were found in noticeable quantities. The isotope  $Tb^{155}$  with  $T_{1/2} = 2,4$  days may be regarded as certainly existent. Best visible in the  $\gamma$ -spectrum of  $Tb^{155}$  is the group of lines in the range from 205 to 310 keV. The intensity of this  $\gamma$ -line group observed in the Tb fraction spectrum decreased at a rate of  $T_{1/2} \sim 2,7$  days. The other  $Gd^{151}$  isotope found (daughter isotope) belongs to class B, its half-life  $T_{1/2}$  being 120 - 150 days according to the authors' data, the  $\gamma$ -spectrum consisting of the lines 164 and 247 keV. For the parent substance a half-life  $T_{1/2} = 18 \pm 2$  hours was found. - In view of the genetic connection between  $Tb^{151}$  and  $Gd^{151}$  which was not observed before, the mass numbers for these isotopes may be considered as more trustworthy than had formerly been assumed. Since the presence of  $Tb^{154}$  in the  $\alpha$  fraction could neither be confirmed nor excluded in these experiments, it cannot be stated with certainty to which of these isotopes (or their mixtures, the 270 and 345 keV  $\gamma$ -lines belong that were observed by the authors. - The fact that Eu is absent among the daughter elements permits us to say that the  $\alpha$ -decay component in  $Tb^{155}$

Card 2/3

Y 4 - 10 - 1 - 7 - 6

Mass Numbers of the isotopes having neutron efficiency

could not be obtained (as compared with electron capture). Examination of short-life reaction products of  $^{140}\text{La}$  and  $^{140}\text{Ce}$  by the method of  $\beta$ - $\gamma$  coincidences made it possible to establish a genetic connection between  $^{140}\text{La}$  and  $^{140}\text{Ce}$ . Since the mass number determined for  $^{140}\text{La}$  is considered to be trustworthy, this connection permits to take the  $A$  value for  $^{140}\text{Ce}$  as well. - Acknowledgement is made to N. V. Zhebrovzhenskii and V. N. Melnikov who were helpful in chromatographic separation, and to N. Kuznetsov for his assistance with the measurements. There are 1 figure, 1 table, and 15 references, 6 of which are Soviet.

ASSOCIATION: Radiyevyi institut im. V. G. Khlopina Akademii nauk SSSR (Radio Institute imeni V. G. Khlopina, USSR)

Card 3/3

1958-11-26

Author: Koshitskiy, G. M., Murin, A. M., Sokolovskiy, I. I.

Title: Spectra of  $\gamma$ -rays of isotopes with a half-life of  $T_{1/2} = 52$  days and of cerium isotopes with a half-life of  $T_{1/2} = 4,3$  days from a macroscopic sample of cerium metal. **periodom**  $T_{1/2} = 4,3$  dn. i  $\gamma$ -periodom polurazpada  $T_{1/2} = 4,3$  dn.

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya fiziko-matematicheskaya, 1958, Vol. 22, Nr 7, pp. 911-914 (USSR)

ABSTRACT: The  $\gamma$ -spectrum of the cerium fraction (obtained from a "thorough" (*glubokoye*) fission reaction) was investigated with a  $\gamma$ -scintillation spectrometer in the scintillation equipment for  $\gamma$ - $\gamma$  coincidences. A description of the scintillation counter and of the measuring method is given in reference 1. In order to determine the content of  $Gd$  ( $T_{1/2} = 5$  days) in the cerium fraction, the energy of the  $\gamma$ -line in the range of 115 keV was carefully measured. It was found that the proportion of cerium with a half-life of 4 days ( $E_{\gamma} = 115$  keV) is much smaller in the preparation than it is in  $Gd^{152}$ . The  $\gamma$ -spectrum of  $Gd$  with a half-life of 5 days consists of two

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Mass Numbers of Gadolinium Isotopes with a Half-Life of  $T_{1/2} = 10^{-12}$  Days and of Europium Isotopes with a Half-Life of  $T_{1/2} = 1,3$  Days

lines at an energy of the order of  $115 \text{ keV}$  and of one  $\gamma$ -line at an energy of  $115 \text{ keV}$ . The energy of the  $\gamma$ -line is in incide with respect to their moment of emission. These are apparently resonance  $\alpha$ -neutron-deficient isotopes with periods close to each other. One of them could be the europium isotope  $\text{Eu}^{145}$ , which was investigated by Hoff (1957) (1958). The mass number of isotopes can be determined by comparing the  $\gamma$ -spectra with  $\gamma$ -spectra of already investigated isotopes. It is attempted to ascribe such mass numbers to the isotopes of the decay chain

$$21 \xrightarrow[51 \text{ days}]{} 22 \xrightarrow[4,5 \text{ days}]{} 23 \xrightarrow[4,5 \text{ days}]{} 24$$

as not to contradict the evidence available on isotopes with a neutron deficit. The energy levels of the  $\alpha$ -nuclei will agree with the values which could be expected from an excited state of an odd-odd  $\text{Eu}^{146}$  and an even-even nuclide  $\text{Sm}^{146}$ . Hence it must be expected that the energy of the first vibration level will be close to the energy of the corresponding level of  $\text{Eu}^{146}$ . The  $\alpha$ -nuclei also have two neutrons outside of the closed shell and an even number of protons. This is actually the case. The chain of radioactive transformations

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A set of bearings or latitude and longitude coordinates  
of ground stations is provided by the following:

$\begin{matrix} \text{Lat. } 17^{\circ} 18' 00'' \\ \text{Long. } 106^{\circ} 09' 00'' \end{matrix}$	$\begin{matrix} \text{Lat. } 17^{\circ} 18' 00'' \\ \text{Long. } 106^{\circ} 09' 00'' \end{matrix}$
--	--

1. Print out its final order, which is contained:

$$6d^{74} \xrightarrow[\text{10 days}]{\beta^-} 6d^{74} \xrightarrow[\text{4, 7 days}]{\beta^-} 6d^{8m}$$

4. V. Galitsin assisted in the work. There are 4 figures, 1 table, and 6 references, 5 of which are Soviet.

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(Radium Institute imeni V. G. Khlopina AN USSR)

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SOV/13-22-7-9/26

AUTHORS: Dobronravova, A. N., Krizhanskiy, L. M., Marin, A. N.,  
Pokrovskiy, V. N.

TITLE: Mass Numbers of Lanthanum Isotopes With a Neutron Deficit  
(Massovyje chisla neytronodefitsitnykh izotofov disprozija)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958,  
Vol. 22, Nr 7, pp. 815 - 816 (USSR)

ABSTRACT: When the authors investigated the Dy-fraction and the genetic  
relations of the Dy-isotopes with their daughter elements  
(Tb and Gd), they arrived at the conclusion (ref 4) that iso-  
topes with a mass number of 159, 157, 155, and 153 must be  
contained in the Dy-fraction. In order to check on this  
assumption it was attempted to determine directly the masses  
of the Dy-isotopes, which are produced in a "thorough"  
(glubok) Ta-fission reaction. For this purpose the Dy-fraction  
was separated in the mass spectrometer. The  $\beta$ -spectra of the  
separated Dy-isotopes were recorded with a scintillation  
spectrometer. A MC-2 industrial-type mass spectrometer was  
used for the separation. In order to increase the intensity

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SOV/48-12-1-9/26

Mass Numbers of Dysprosium Isotopes With a Neutron Deficit

of light the slits were somewhat widened and the tungsten filament cathode was platinated. The preparations were investigated on a gascounting spectrometer with a NaJ(Tl)-crystal with a size of 30 x 20 mm. Radioactive isotopes of Dy with a mass number of 159, 157, 155, 153, and probably of 151 were found. The low activity of the Dy<sup>159</sup>-sample, and the very low one of the Dy<sup>151</sup>-sample did not permit a further investigation. From the evidence collected the following conclusions could be drawn: Dy<sup>157</sup>: half-life  $T_{1/2} = 8.5 \pm 0.1$  hours. A radioactive daughter substance was not found. The  $\gamma$ -spectrum shows 80- (weak) and 325 keV-lines. Dy<sup>155</sup>:  $T_{1/2} = 3 \pm 2$  hours. A radioactive daughter substance with a half-life of about 5 days (Tb<sup>155</sup>, Refs 4, and 6) was found. The  $\gamma$ -spectrum of Dy<sup>155</sup> consists of 80- (dubious) and 227 keV-lines. Dy<sup>153</sup>:  $T_{1/2} = 7 \pm 5$  hours. A radioactive daughter substance with a half-life of about 2 days (Tb<sup>153</sup>, Ref 7) was found. The  $\gamma$ -spectrum of

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Mass Numbers of Dysprosium Isotopes With a Neutron Deficit

$Dy^{153}$  contains the 80 keV-line. There are 9 references,  
6 of which are Soviet.

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